



Process Knowledge Destinations

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OUTLINE

- Depot Maintenance Domain
 - characteristics
 - efforts/philosophy
- Common to ALL Efforts
- Process Knowledge Destinations
- Needs

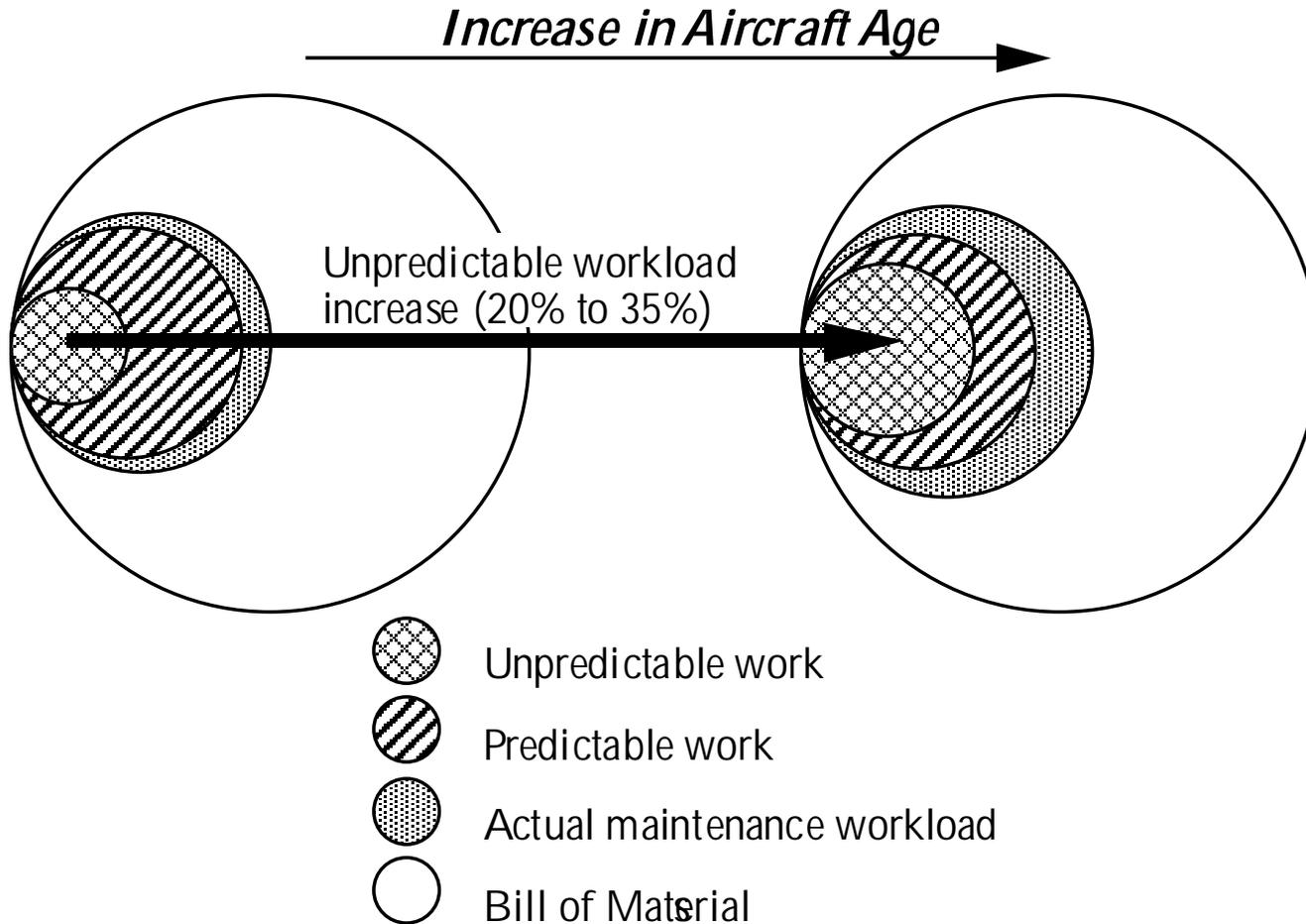


Maintenance Domain

- Context, major repair
- Inspections
- Types of Work
- Shop Floor Origin
- Variability - how big is it?



Key Problem: Unpredictable Workload





Process Improvement Efforts

- IPI, '88
- TQM, '88
- SEI CMM, '90
- BPR, '94
- Lean Logistics, '94
- ISO 9000, '95
- ABC, '98



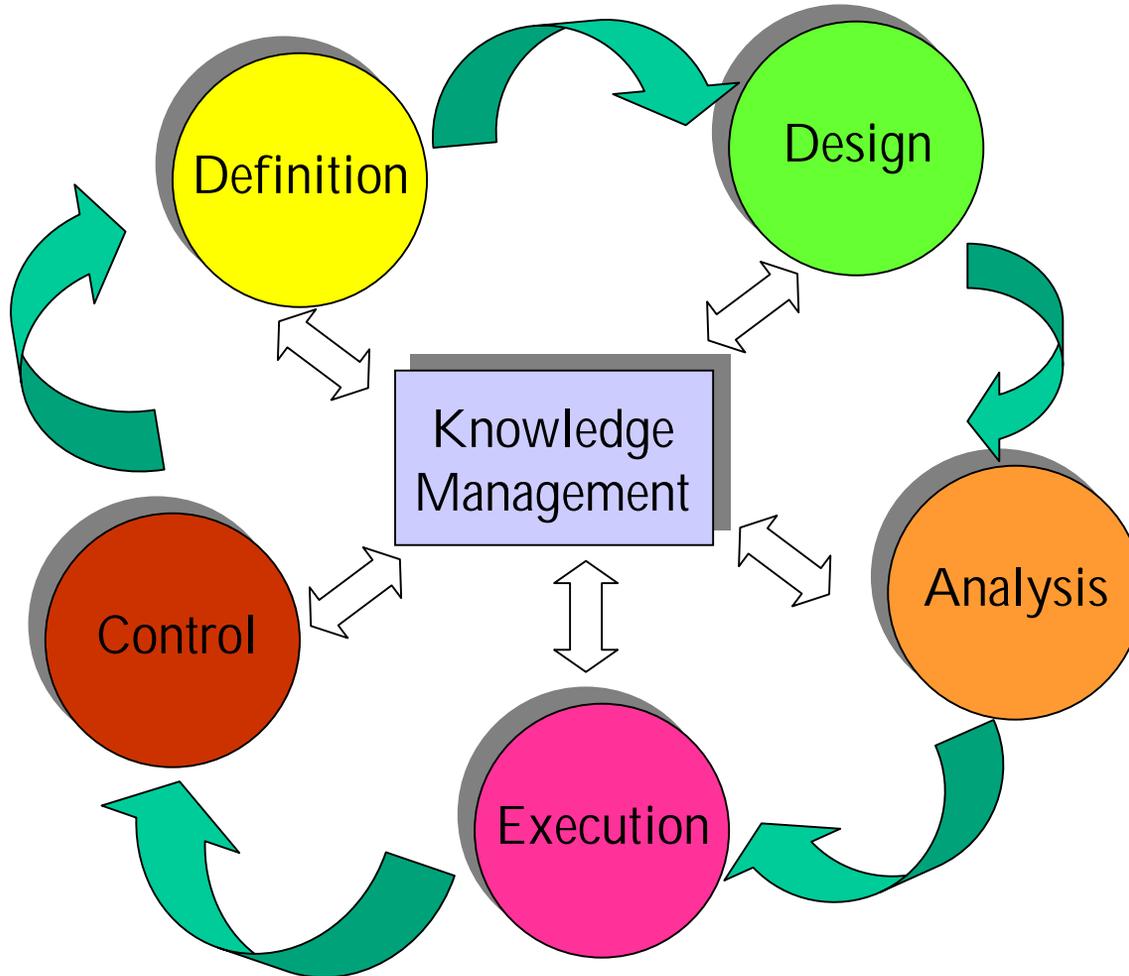
Process Information Technology



- Information technology that addresses the needs of process management
- Process management
 - Conceptualization, design, analysis, execution, and control of processes



The Process Life Cycle





Significance of Process Information Technology



- Processes are pervasive
 - Influence every organization
 - Are critical to many communities
 - Software Engineering, workflow, planning and scheduling, BPR/CPI, knowledge management, supply chain management
- Process technology has largely been ignored by the scientific community
 - Focus has been on *product* at the expense of *process*
- Significant pay-off
 - Critical for managing change in an increasingly unpredictable environment
 - Important requirement for *agile* enterprises



Why Process Management is Hard



- Processes are intrinsically abstract
- Representational requirements are complex
- Analysis mechanisms are complex
- Inadequate foundations
 - Ontologies, representation, sharing, reasoning
- Technology has lagged industry needs
 - Inadequate scientific effort focused on process
 - Progress has been ad hoc
 - Technology stovepipes
 - Lack of synergy

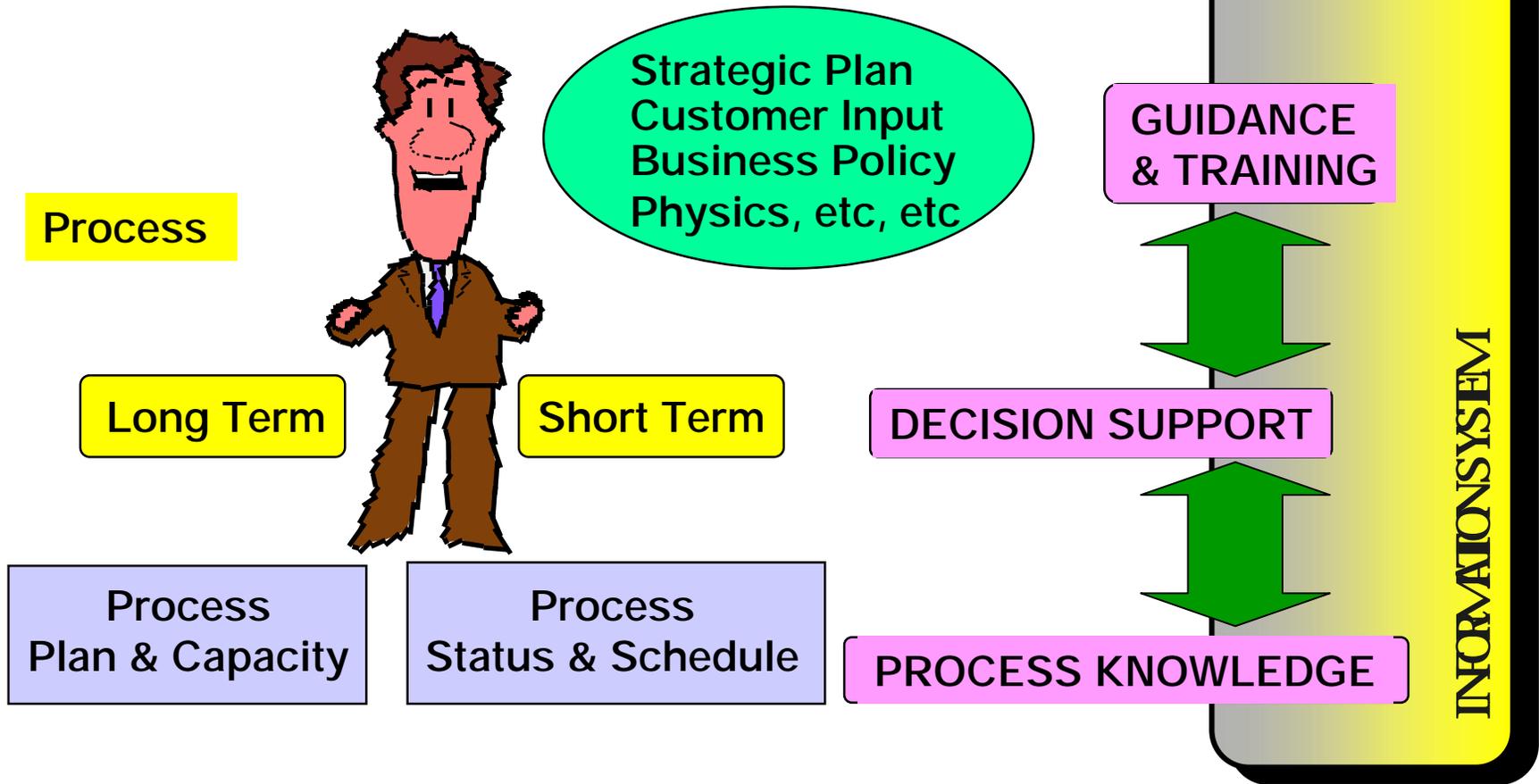


Common to ALL Efforts

- Answer two questions
 - What is the process?
 - What is the impact of a change on the process?
- Have been using two tools
 - IDEF3, ProSim
 - Stochastic simulation, WITNESS



Process Manager/Worker Needs:





Process Knowledge Destinations

- Analysis
 - evaluate/improve cost/time of process
- Quality
 - evaluate/improve output of process
- Planning/Scheduling
 - estimate/predict requirements/performance
- Training
 - prerequisites, basic, advanced, leading edge
- Information Systems
 - needed from process
 - needed by process
- Day-to-Day Management
 - status/tweak to completion



Two Faces of Process Knowledge

- Towards humanity
 - build consensus of understanding among experts
 - train novices in execution of process
- Towards the computer
 - build applications to support process execution, status, or analysis



Destination Examples

- E3 PDM - prototype planning module with perpetually valid simulation online
- Ogden Annual PDM Workload - raw planning data to project plan and to stochastic simulation
- Pacer Lean Avionics - raw data driven perpetually valid simulation
- ITS training - IDEF3 knowledge to MS Windows Help
- Lean Value Chain for Critical Parts - Supply Chain Modeling and Optimization



Air Logistics Center Challenges



- Can existing commitments be maintained?
- Can new aircraft workload be performed competitively?
- How do I allocate critical resources?
 - dock space
 - critical skills
 - equipment and tools



Workload Planning & Scheduling Functions



- Determination of time-phased resource requirements
- Identification of capacity shortages
- Work sequencing
- Time phased allocation of resources to work elements
- Identification and resolution of bottleneck resource issues
- Schedule optimization



Benefits of Workload Planning & Scheduling Technology Applications at ALC



- Ability to respond rapidly to product and process changes
- Take advantage of reliable and up-to-date performance feedback
- Better assessment and control of costs
- Better work-plan realization



Workload Scheduling Example



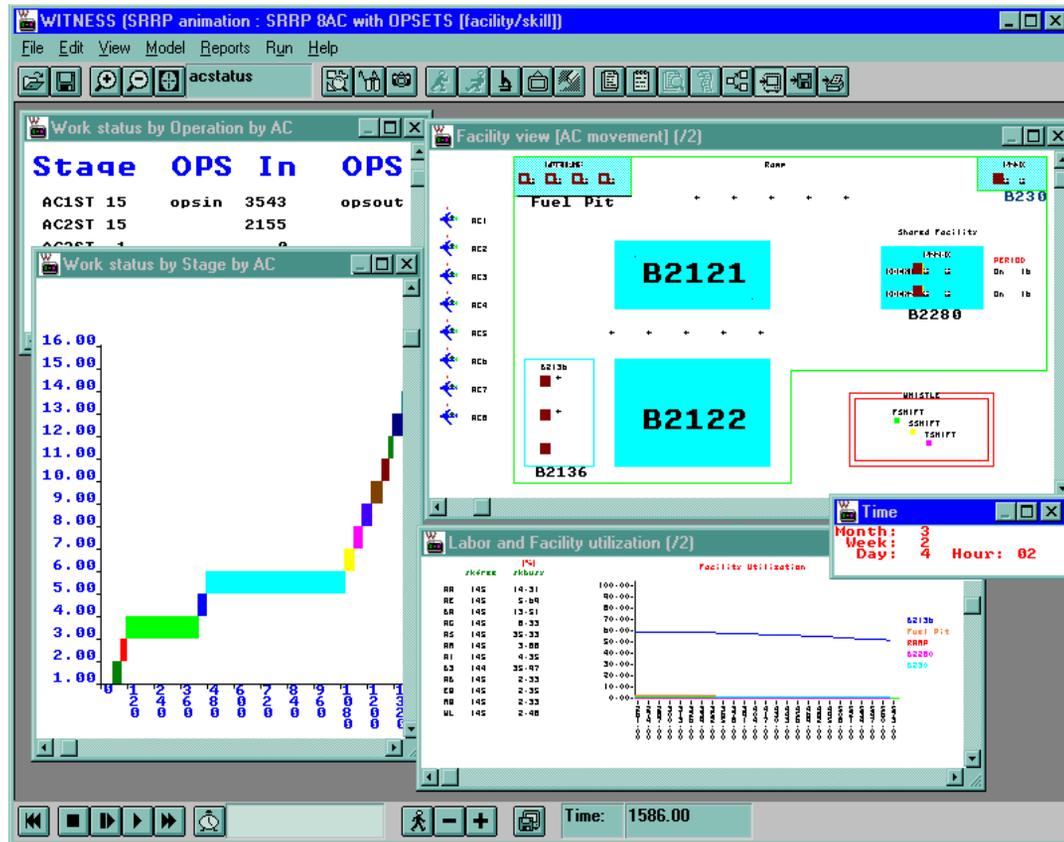
- Problem Focus
 - Reduce PDM cycle time and Improve PDM flexibility, responsiveness, and economy
- Solution Strategy
 - Provide a system to provide planning decision support
 - Simulate PDM line schedule
 - Integrate with shop floor statusing systems



Workload Planner Tool



- Technology Developed
 - Reconfigurable, self maintaining, system simulator
 - Integrated with ALC data acquisition systems





Process Technology Needs

- Integrated modeling, analysis, and execution
- Process knowledge repositories for storage, maintenance, and just-in-time delivery of process knowledge
- Integration of process modeling tools with scheduling and statusing systems
- Adaptive, reconfigurable process modeling and analysis tools
 - Tools can be reconfigured easily when requirements change
 - Process reconfigures itself when the process execution performance deteriorates



Summary

- Depot Maintenance Domain Characteristics
- Process Management Technology Applications
 - Process improvement
 - Workload planning and scheduling
- ALC Process Technology Needs